MULTICHANNEL COMMUNICATION SCIENCES, INC.
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Ron D. Katznelson, Ph.D.
President

March 11, 1994

Mr. William Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554
BY EXPRESS MAIL

Re: **Multichannel Communication Sciences, Inc.**
Ex parte Notice in ET Docket No. 93-7, in the matter of compatibility between cable systems and consumer electronics equipment.

Dear Mr. Caton:

Pursuant to the ex parte requirements of Commission Rules 1.1202, 1.1203 and 1.1206(a), 47 C.F.R. §§ 1.1202, 1.1203 and 1.1206(a), Multichannel Communication Sciences, Inc. ("MCSI") hereby advises the Commission that ex parte meetings were held at MCSI's request on March 10 and March 11, 1994, at which time the material attached hereto was presented to the following Commission staff members:

Merril Spiegel, Legal Advisor to Chairman Reed Hundt,
Maureen O'Connell, Legal Advisor to Commissioner James Quello,
James Coltharp, Legal Advisor to Commissioner Andrew Barrett,
Bruce Franca, Deputy Chief Engineer, Office of Engineering & Technology,
Alan Stillwell, Office of Engineering & Technology,
John Wong, Cable Service Bureau.

MCSI's presentation concerned its request for clarification of the Commission's Rules that will permit cable operators to charge separately for addressable descrambling equipment used to receive regulated tiers and all related authorized channels simultaneously in the clear, even if such customer equipment is installed outside a subscriber's home. A brief summary of the discussions including the specific questions propounded by the Commission staff with MCSI's responses thereto follow below.

"Simultaneously In the Clear" Signal Technologies

MCSI submitted that the Commission should not be dissuaded from pursuing a regulatory program that encourages the supply of all authorized analog signals "simultaneously in the clear". Therefore, MCSI requested that the Commission ensure that there are no disincentives for cable operators to adopt and support technologies such as Broadband Descrambling that can accomplish substantial compatibility for the growing installed base of consumer electronics equipment. MCSI stated that those who call upon the Commission to abandon its regulatory plan to encourage "simultaneously in the clear" approaches, failed to provide an alternative for the effective achievement of substantial compatibility relief for all consumer electronics equipment as required by Section 17 of the Cable Act.

MCSI stated that while it agrees with the Commission that its proposed rule prohibiting separate charges to subscribers for Component Decoders may increase operator's future incentives to adopt technologies that supply all authorized signals in the clear, MCSI believes that this rule essentially provides no such incentives during this decade. In order to explain MCSI's assertions regarding the lack of such incentives during this time frame, MCSI pointed out that the Decoder Interface standardization effort is likely to be protracted and in addition MCSI provided two penetration models of Decoder Interface deployment scenarios. The models show that in the next ten years, even in the most aggressive supply and purchase assumptions for Decoder Interface equipped consumer electronics equipment, substantial penetration levels of Decoder Interfaces devices will not be achieved. Thus, the "no separate charge" provision for Decoder Interface devices will not have any significant impact on operators' choice of access control technology. Rather, in the next 10 years, operators' choice will mostly be between the supply of set-top descramblers or the use of "simultaneously in the clear" signal supply technologies.

Permitting Cable Operators to Charge Separately for Customer Descrambling Equipment Installed Outside the Subscriber's Home

MCSI explained that Broadband Descrambling devices may be installed on the side of subscribers' homes at a point of entry, or inside a nearby pedestal or on a pole. Wherever deployed they may be provided as plug-in units during the subscription period required by the subscriber. This is similar to the situation wherein a set-top device is provided to subscribers during the required subscription period. Hence, the utility and functionality of such broadband subscriber equipment is virtually identical to that of set-top descramblers. Because it can provide the subscriber with all authorized channels simultaneously in the clear throughout the home, Broadband Descrambling is the only descrambling technology that can beneficially function outside the home.

MCSI explained that unlike the "negative control" of traps and interdiction, the installation of which may be required when the subscriber does not wish to receive certain programming that these devices can deny, the "positive control" associated with descrambling permits the subscribers to request that a Broadband Descrambler be installed for their terminals, only when they wish to receive (and thus pay for) access to scrambled channels. Therefore, in contrast to costs of traps or interdiction, costs for Broadband Descrambling devices, should be separately charged only when subscribers elect to receive the regulated programming which is enabled by the Broadband Descrambler device. Thus, subscribers will enjoy the same level of consumer protection as available to them by using set-top descambler as Congress intended in Section 623(b)(3)(A) of the Cable Act (emphasis supplied):

> "Equipment.--The regulations prescribed by the Commission under this subsection shall include standards to establish, on the basis of actual cost, the price or rate for--
>
> "(A) installation and lease of the equipment used by subscribers to receive the basic service tier, including a converter box and a remote control unit and, if requested by the subscriber, such addressable converter box or other equipment as is required to access programming described in paragraph (8);"

MCSI noted that Broadband Descrambling devices are in the category of "other equipment as is required to access programming" and that one cannot find any statutory distinction between addressable converter boxes and such other customer "equipment required to access programming". Nor is there any mention or limitation that such equipment be located inside the home.

MCSI observed that the Commission's regulations now permit separate charges for set-top descramblers located within the subscriber's home. Faced with this option, if the Commission's regulations will not likewise permit cable operators to separately charge for Broadband Descramblers if installed outside the subscriber's home, cable operators will be unlikely to invest in deploying such "in the clear" technologies and subscribers will be unable to benefit from the substantial compatibility relief such technologies offer. Therefore, MCSI stated its belief that operators employing these devices deserve equipment cost accounting and rate structure treatment at least as favorable as those afforded to operators utilizing consumer unfriendly set-top devices. Unlike other cable plant distribution components, DBD modules are installed for individual subscriber locations based on specific subscriber demands.

THEREFORE, MCSI PROPOSED THE FOLLOWING CORRECTION FOR THE FIRST CLAUSE OF THE COMMISSION'S RULE IN 47 C.F.R. §76.923(a):

"(a) Scope. The equipment regulated under this section consists of all [*customer*] equipment ~~in a subscriber home~~ [*that upon the subscriber request*] is used to receive....

Questions and Answers

FCC Staff, Q1: OET staff indicated that, regarding cable operators' implementation of scrambling and descrambling systems, the Commission's goal is to consider these systems, including related subscriber equipment, as part of the cable system and that these cost elements are based on operators' technology choices to secure the distribution of their signals on their cable plant and therefore should not be passed on as separate charges to subscribers. How should the Commission reconcile this goal and permitting separate charges for Broadband Descrambling?

MCSI, A1: This Commission's "Access Control-Plant bundling" goal may be laudable but the Commission does not apply it to set-top descramblers. Indeed, nowhere in the Cable Act can we find a directive for such bundling. Nevertheless, MCSI acknowledges that in certain circumstances, a bundling that prohibits separate equipment charges may serve the public interest by facilitating a balance between certain seemingly conflicting statutory goals of the Cable Act. However, the mere bundling for the sake of bundling must not be sought as a goal, if it only detracts from the achievement of Congress' intent. Applying this bundling principle to Broadband Descrambling subscriber equipment installed outside a subscriber's home, while permitting separate charges for set-top descramblers is unlikely to provide lower cost solutions[1] to the subscriber or otherwise achieve any other public interest goals. Rather, it will detract from the full achievement of compatibility between consumer electronics equipment and cable systems.

MCSI submits that the Commission's arbitrary treatment of outside deployment of Broadband Descrambling subscriber devices in a manner that differs from that afforded set-top descramblers for the purposes of cost accounting would result in unintended disincentives for cable operators to deploy

[1] The attached slide entitled "Comparison of Monthly Equipment Charge Projections" illustrates that based on the Commission's own rate survey, set-top approaches may result in higher monthly charges for subscribers as compared to those based on Broadband Descramblers.

broadband descrambling technologies that are far more responsive to subscriber needs and to Congress' intent of assuring compatibility as expressed in Section 17 of the Cable Act (§624A). Therefore, MCSI expressed its position that the public interest would be served by Commission's equipment charge rules permitting cable operators to recover their investment and charge equipment rates for descrambling subscriber equipment devices installed outside a subscriber home for providing regulated services in the same manner that operators may charge such equipment rates for set-top subscriber equipment inside the subscriber's home.

FCC Staff, Q2: Suppose the Commission accepts MCSI's recommendations for correcting the equipment scope clause in §76.923(a) by the removal of the "inside the subscriber home" limitation. Despite MCSI's proposed addition of a further limitation provided by the phrase "that upon the subscriber request is used to receive [regulated programming services]..", cable operators would be able to argue that with this amendment, traps may qualify for separate charges since the use of traps facilitates the cable operator's ability to offer tiers the subscriber can receive "upon the subscriber request", and therefore, indirectly, traps facilitate the offering and thereby are "used to receive" such requested tiers. How should the Commission deal with such broad interpretation attempts?

MCSI, A2: The Commission must augment the modified rule and clarify its intent in the Order by establishing an explicit narrow reading of the terms for customer equipment "used to receive [regulated programming services]". The clause should be interpreted on a subscriber by subscriber basis. That is, a *specific* subscriber is assessed separate charges for equipment which specifically enables *that* subscriber to receive the specific regulated tier which that subscriber specifically requested. Hence, the insertion of a trap or an interdiction device that deny the reception of a tier that was not requested at a given subscriber location does not meet the technical test cited above, as these devices do not specifically enable the reception of the specific tier which that subscriber requested. Furthermore, in order to limit the categories of equipment installed outside the subscriber's home that qualifies under §76.923(a), the Commission should exclude subscriber cable drop and external line amplifiers.

FCC Staff, Q3: Does MCSI'S "Comparison of Monthly Equipment Charge Projections" slide include installation charges?, How do installation charges for Broadband Descramblers compare with that of set-top decoders?

MCSI, A3: We understand that the Commission's separate equipment charges are based on establishing an equipment cost "basket" which includes the average equipment installation and maintenance costs. Therefore these charges include installation costs. To the extent that Broadband Descrambling devices may require a one-time installation of a secure point-of-entry ("POE") box containing the plug-in device, that installation cost will not be incurred again upon a removal of the module or the reinstallation of such module in an existing POE box due to service churn. Averaged over a period of one year, the operator's recurring costs for such installation churn should not differ significantly from those costs incurred by the industry today due to addressable set top descrambler churn[2]. Thus, MCSI assumed that the hardware purchase cost constitutes a monthly charge indicator.

MCSI's information on prices charged to cable operators who buy less than 10,000 units of dual watch & record descramblers is a unit price in excess of $240. Time Warner in New York charges

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[2] Industry average operational statistics for typical addressable cable system indicate that an average set-top addressable descrambler churns twice a year.

their subscribers $5.13/month for the lease of such device. In proportion to that, based on MCSI's projections of $140-$170 (depending on features) for the selling price of addressable Broadband Descramblers, and including an amortized POE first installation cost increment, a monthly charge of less than $4 is projected. This has to be contrasted with a total average monthly charge of $7.73 that subscribers would be assessed in order to achieve the same level of service using set-top descramblers.

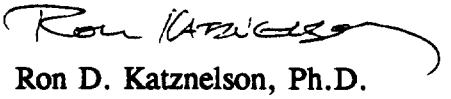
In any event, unlike set-top descrambler and access control hardware purchase costs, the installation cost components of subscriber equipment is the most protected actual cost component, since it involves labor components that are subject to local regulatory scrutiny. Furthermore, by correcting Section 76.923(a) of its Rules substantially in accordance with MCSI's proposal, the Commission has the ability to monitor and periodically review its use by cable operators in order to protect subscribers. This approach is consistent with Section 17 of the Cable Act stating that "The Commission shall periodically review and, if necessary, modify the regulations issued pursuant to this section in light of any actions taken in response to such regulations and to reflect improvements and changes in cable systems, television receivers, video cassette recorders, and similar technology." [§624A(d)].

Conclusion

In concluding the meeting, MCSI respectfully urged the Commission to correct Section 76.923(a) of its Rules and to incorporate language substantially as that attached hereto that is intended, upon subscriber request, to permit cable operators to charge separately for customer equipment used to receive regulated services.

Any questions regarding this notice should be addressed to the undersigned.

Very truly yours,



Ron D. Katznelson, Ph.D.
President,
Multichannel Communication Sciences, Inc.

cc: Merril Spiegel, FCC
Maureen O'Connell, FCC
James Coltharp, FCC
Bruce Franca, Office of Engineering & Technology, FCC
Alan Stillwell, Office of Engineering & Technology, FCC
John Wong, Cable Service Bureau, FCC
William Johnson, Mass Media Bureau, FCC

MULTICHANNEL COMMUNICATION SCIENCES, INC.

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION

ET DOCKET NO. 93-7

MCSI'S EX PARTE PRESENTATION
IN THE MATTER OF COMPATIBILITY BETWEEN CABLE SYSTEMS AND CONSUMER ELECTRONICS EQUIPMENT

Presented by
Dr. Ron D. Katznelson, President
MULTICHANNEL COMMUNICATION SCIENCES, INC.
MARCH 10,11, 1994

1. **THE DECODER INTERFACE WILL NOT BRING COMPATIBILITY RELIEF WELL UNTIL THE TURN OF THE CENTURY.**

   - REQUIRES TECHNICAL STANDARD SETTING
   - DEPENDS ON SLOW REPLACEMENT OF CONSUMER ELECTRONICS
   - REQUIRES COMPONENT DECODER IN EVERY TV RECEIVING DEVICE.

2. **CONSEQUENTLY, THE COMMISSION SHOULD NOT BE DISSUADED FROM ENCOURAGING THROUGH RATE REGULATIONS THE IMPLEMENTATION OF "SIMULTANEOUSLY CLEAR SIGNAL" DELIVERY.**

   - THE POTENTIAL DEVELOPMENT OF DIGITAL TRANSMISSION ON CABLE CANNOT DETRACT FROM THE LONG TERM BENEFITS OF SIMULTANEOUSLY CLEAR SIGNAL PROVISIONING OF ALL ANALOG CHANNELS.
   - WHILE MCSI AGREES WITH THE COMMISSION THAT ITS PROPOSED RULE PROHIBITING SEPARATE CHARGES FOR COMPONENT DECODERS INCREASE OPERATOR'S INCENTIVES FOR SUPPLYING ALL AUTHORIZED ANALOG SIGNALS IN THE CLEAR, IT ESSENTIALLY PROVIDES NO SUCH INCENTIVES DURING <u>THIS</u> DECADE.
   - THE COMMISSION MUST AUGMENT ITS INCENTIVES FOR "SIMULTANEOUSLY CLEAR" DELIVERY OF ANALOG CHANNELS BY INCENTIVES EFFECTIVE IN <u>NEAR TERM</u> IN ORDER TO PROVIDE RELIEF FOR ALL INSTALLED BASE AND FUTURE EQUIPMENT THAT WILL HAVE NO DECODER INTERFACES.

2. CONT'D.

- REMOVE DISINCENTIVES (AS COMPARED WITH SET-TOP USE) BY CLARIFYING THAT OPERATOR'S ARE PERMITTED TO SEPARATELY CHARGE FOR DESCRAMBLING EQUIPMENT OUTSIDE THE SUBSCRIBER HOME. (PROVIDING "SIMULTANEOUSLY CLEAR CHANNELS"). - ENSURE NO LESS THAN PARITY WITH SET-TOP EQUIPMENT CHARGES RULES.

- REMOVE DISINCENTIVES FOR "SIMULTANEOUSLY CLEAR" DELIVERY OF SIGNALS ASSOCIATED WITH DPU MITIGATION MEASURES INCLUDING THE INSERTION OF SET-TOP CONVERTERS. BY ASSURING EARLY COMPLIANCE OF RF INTERFACE SPECIFICATION FOR TELEVISION RECEIVING DEVICES. ("CABLE-READY" I PROPOSAL)

- PROVIDE RATE BENCHMARKS INCENTIVES FOR *SCATS* SUPPLY. (SEE MCSI'S COMMENTS)

- THE COMMISSION'S PRESENT RULES IN SECTION 76.923(a) STATE THE SCOPE OF REGULATED EQUIPMENT:

"(a) Scope. The equipment regulated under this section consists of all equipment in a subscriber's home that is used to receive the basic service tier, regardless of whether such equipment is additionally used to receive other tiers of regulated programming service and/or unregulated service. ... (emphasis supplied).

2. CONT'D.

HOWEVER, CONGRESS DID NOT PROVIDE FOR THE LIMITATION THAT CUSTOMER EQUIPMENT QUALIFYING FOR SEPARATE CHARGES UNDER THE RULES BE INSIDE A SUBSCRIBER HOME. RATHER, SECTION 623(b)(3) OF THE CABLE ACT PROVIDES:

> "Equipment. -- The regulations prescribed by the Commission under this subsection shall include standards to establish, on the basis of actual cost, the price or rate for--
>
> > (A) installation and lease of equipment used by subscribers to receive the basic service tier, including a converter box and a remote control unit and, if requested by the subscriber, such addressable converter box or other equipment as is required to access programming described in paragraph (8);
> >
> > (B) installation and monthly use of connections for additional television receivers." (emphasis supplied).

MCSI'S PROPOSED CORRECTION FOR SECTION 76.923(a):

"(a) Scope. The equipment regulated under this section consists of all [*customer*] equipment ~~in a subscriber home~~ [*that upon the subscriber request*] is used to receive....

EXAMPLES OF TECHNICAL STANDARDS DEVELOPMENTS
- HISTORICAL RECORD -

Subject	Docket Nº(s)	Start	Conclusion	Duration
Cellular Telephone	18262, 79-318	3/68	3/83	15 years
Telephone Terminal Interconnection	19528, 20774	6/72	2/79	5 years
TV Vertical Blanking Interval	20693, 81-741, 84-168	11/75	1/85	9 years
Computing Device RF Emissions	20780, 80-284, 80-439	4/76	7/83	7 years
TV Multichannel Sound (Stereo)	21323	7/77	8/84	7 years
Digital Termination Services	79-188	11/78	5/85	7 years
DBS Standards	80-603, 85-32	10/80	8/86	6 years
Advanced Television Systems (HDTV)	87-268	7/87	Still pending	7+ years

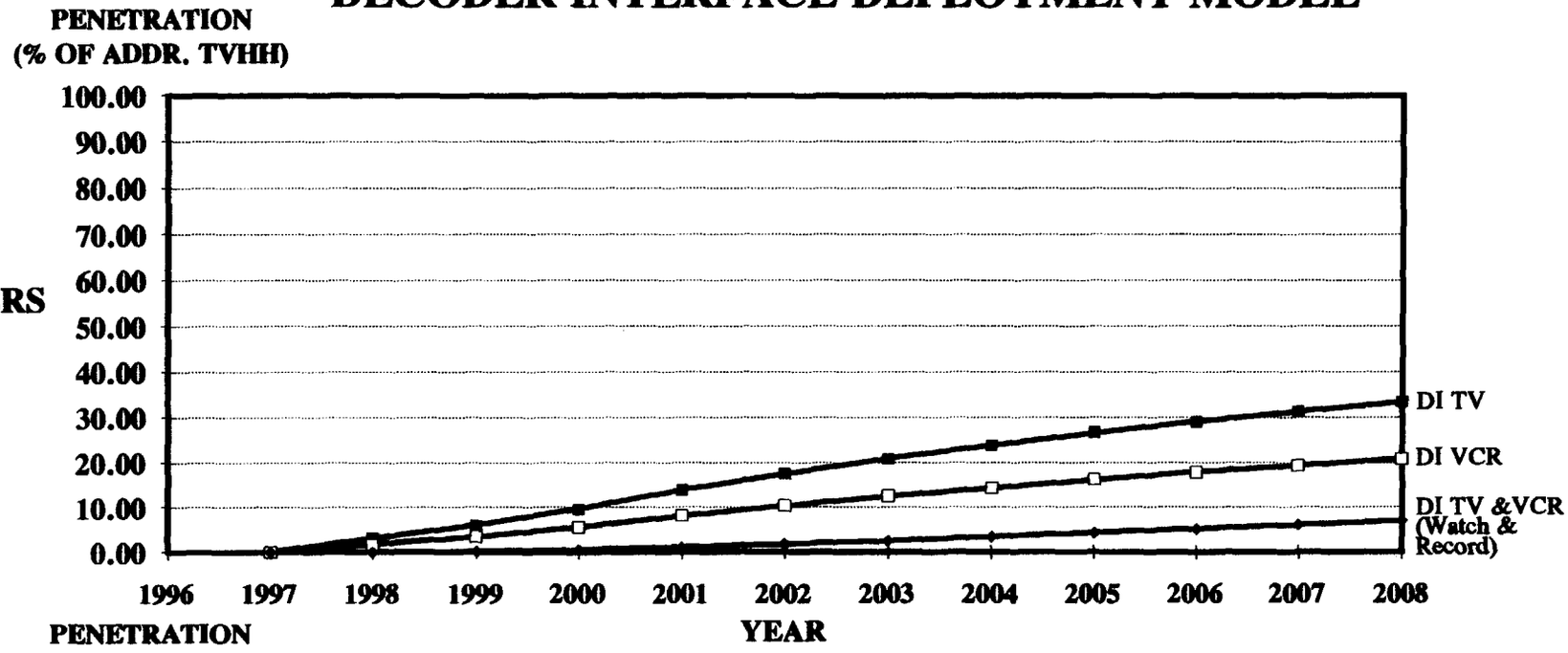
SECTION 17 COMPATIBILITY RELIEF CAN BE ACHIEVED ONLY UPON PROVISION OF COMPONENT DECODERS TO ALL SUBSCRIBER EQUIPMENT

CONSUMER ELECTRONICS EQUIPMENT CONNECTED TO SUBSCRIBER OUTLET	NUMBER OF COMPONENT DECODERS USED PER OUTLET	SECTION 17 STATUTORY ENUMERATED COMPATIBILITY GOALS THAT ARE MET IN FULL		
		Watch one program while recording another	Sequentially recording different programs on different times	Using advanced picture generation and display (Dual tuner PIP)
TV SET WITH DECODER INTERFACE	1	NO	NO	NO
VCR WITH DECODER INTERFACE	1	NO	YES	NO
DUAL TUNER PIP TV SET WITH DECODER INTERFACE	2	NO	NO	YES
TV SET AND A VCR WITH DECODER INTERFACES	2	YES	YES	NO
DUAL TUNER PIP TV SET AND A VCR WITH DECODER INTERFACES	3	YES	YES	YES

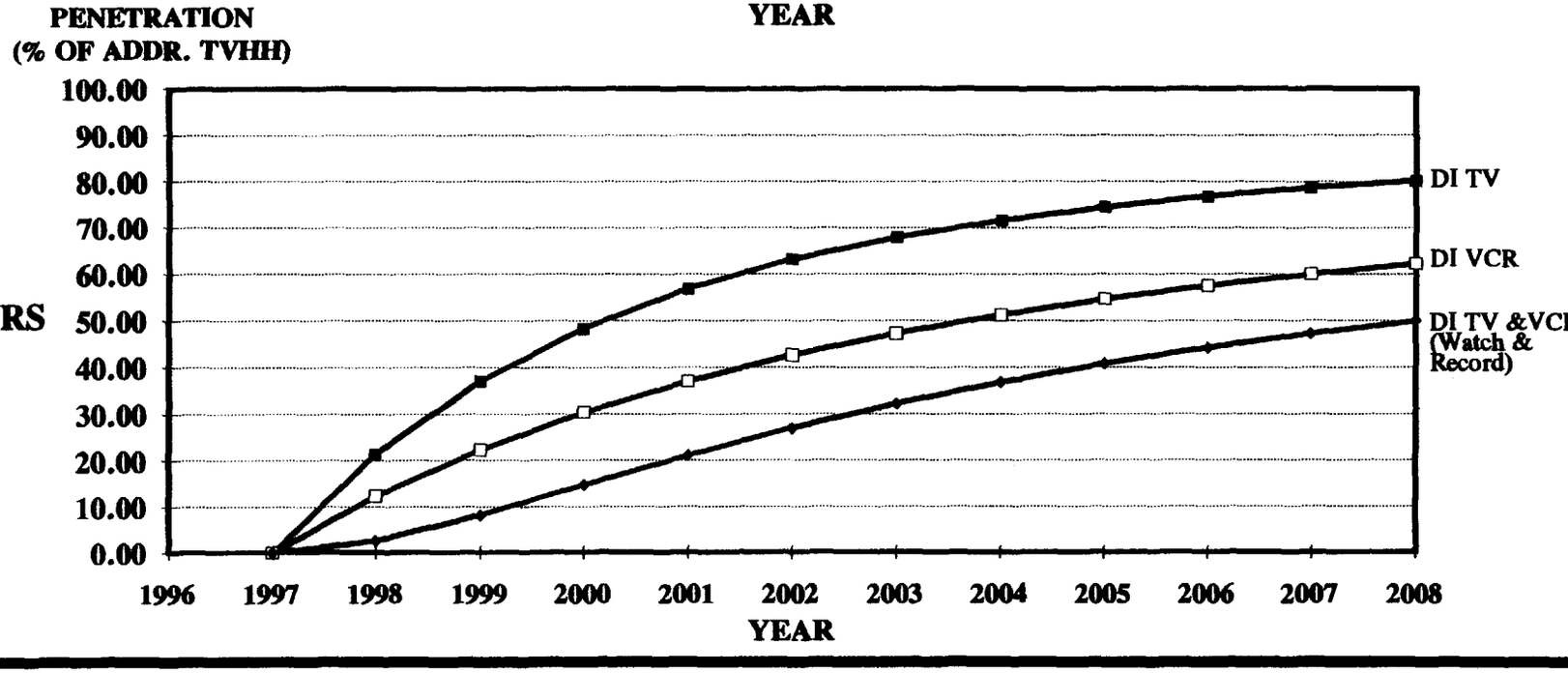
MULTICHANNEL COMMUNICATION SCIENCES, INC.

DECODER INTERFACE DEPLOYMENT MODEL

UP TO 25% OF RECEIVERS EQUIPPED WITH DI



100% OF RECEIVERS EQUIPPED WITH DI



DIPEN.DRW

MULTICHANNEL COMMUNICATION SCIENCES, INC.

COMPARISON OF MONTHLY EQUIPMENT CHARGE PROJECTIONS

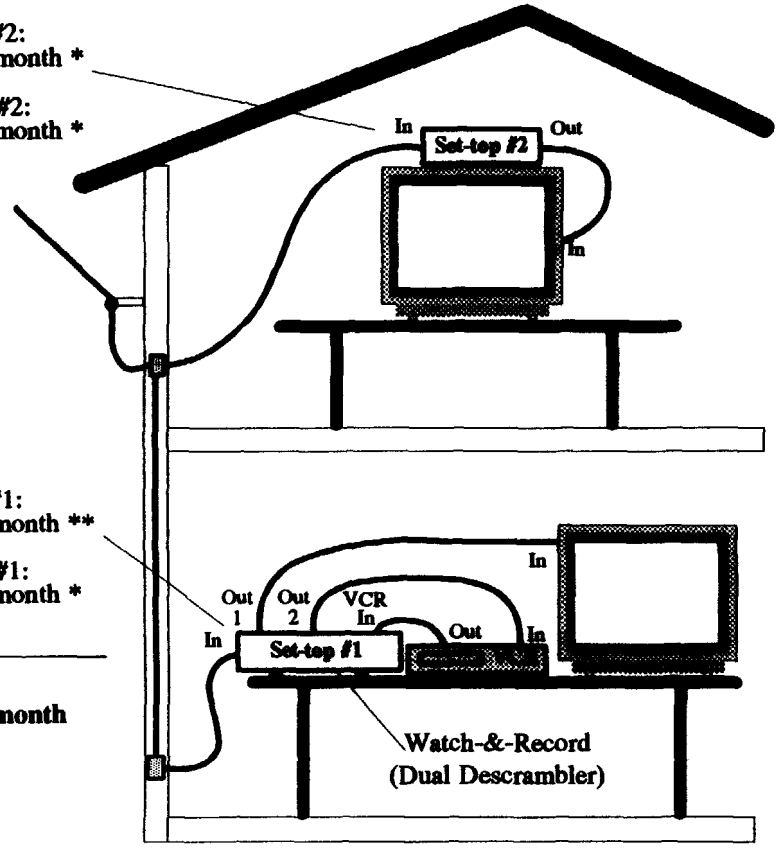
Set-top #2:
$2.14 / month *

Remote #2:
$0.23 / month *

Set-top #1:
$5.13 / month **

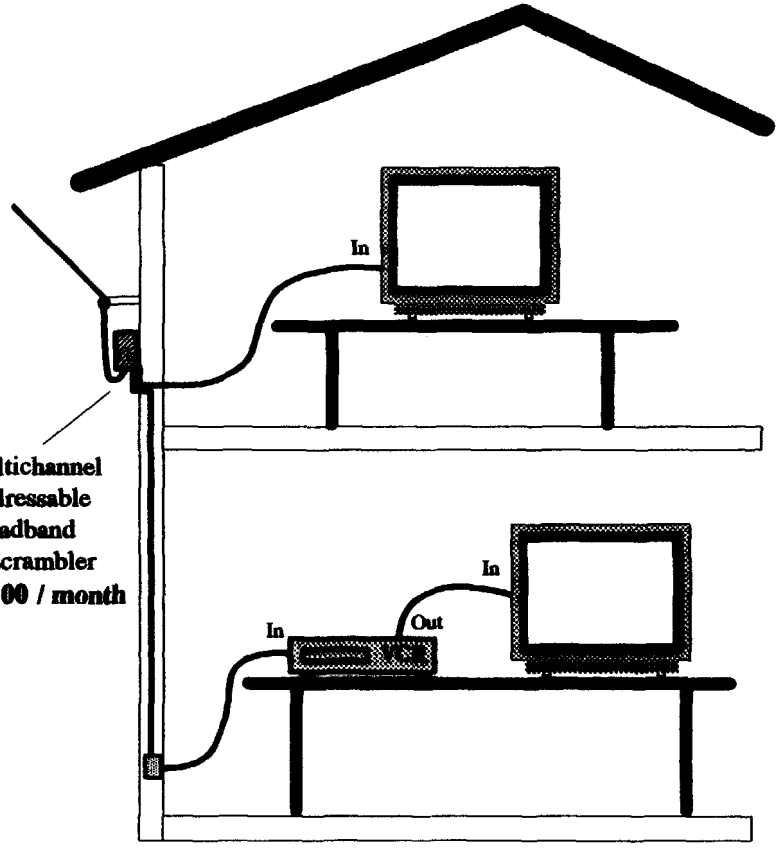
Remote #1:
$0.23 / month *

Total:
$7.73 / month



DUAL CHANNEL SET-TOP DESCRAMBLER, WITH WATCH-N'-RECORD SET-TOP AND VCR, + ADDITIONAL OUTLET SET-TOP

Multichannel
Addressable
Broadband
Descrambler
< $4.00 / month



WHOLE HOUSE SERVICE WITH A BROADBAND DESCRAMBLING DEVICE

* SOURCE: FCC Cable Regulation Impact Survey, Feb. 22, 1994
** SOURCE: Time Warner Cable, New York.

APPENDIX - DECODER INTERFACE DEPLOYMENT SCENARIOS

The following tables depict two scenarios for the introduction of Decoder Interface ("DI") equipped consumer electronics equipment. The first scenario (Table 1) is based on the assumption that only TV's and VCR's that are marketed as "cable-ready" are equipped with the DI and that these higher end sets eventually constitute 25% of U.S. annual product shipments. In this scenario, all other equipment that is not equipped with a DI (which may be able to tune 181 channels) may be marketed without the term "cable-ready" or "cable-compatible".

In order to explore an extreme situation, in the second scenario (Table 2), it is assumed that all receiving devices are equipped with the DI. The assumptions and formulae for each column as identified by the Note Number field in the tables are discussed below. The column identified by Note (4) contains the only independent variable that is different for each of these scenarios and that is the **% Sold With Decoder Interface** (applying both for VCR's and TV's). The attached figure shows the penetration results of Tables 1 and 2 in percent, normalized by the total addressable subscriber base.

Assumptions Common to Both Scenarios

(1) TVHH and CATV Subs. Television Households and Basic CATV subscriber numbers are based on industry projections by Paul Kagan Associates.[1]

(2) Addr. Subs. Addressable subscriber number projections are based on the 21 million estimate for 1993[2] and the recent yearly trend of 2.5 million annual increase in the addressable subscriber base[3]. It is assumed that by the introduction of the DI under this scenario (1997), all descrambling equipment will be addressable, thereby defining addressable homes and homes requiring descrambling equipment essentially the same.

(3) Annual TV and VCR Unit Sales. The unit shipped figures of the Electronics Industries Association for 1993[4] were used assuming no change in annual sales. Because newer consumer electronics equipment is more reliable, a longer product life coupled with a growing TVHH base results (up to first order) in a fixed unit demand. Clearly, any fluctuations that may be taken into account are unlikely to change our cumulative results appreciably.

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[1] "The Cable TV Financial Databook", Paul Kagan Associates, 1992.

[2] *See* Federal Communications Commission, *Consumer Electronics and Cable System Compatibility*, Report to Congress, October 5, 1993 (hereinafter referred to as "Report to Congress"), at page 17, citing *TV Digest*, June 7, 1993 pp. 4-5, a survey showing that 21 million cable subscribers receive cable service with addressable descramblers.

[3] "Pay-Per-View", in *Cable World*, November 30, 1992, p. 32A.

[4] *Consumer Electronics - U.S. Sales 1989-1993 Estimates*, Electronic Industries Association. pp. 3 and 7.

(5) TV's or VCR's Sold With DI. TV receiving devices equipped with a Decoder Interface. For each product category the annual number shipped with DI is given by the **annual shipment number** times (**% Sold With DI** /100%).

(6) (a) New Addr. Subs With DI TV's. New Addressable subscribers who purchase their first Decoder Interface equipped TV that year. Since TV sets (equipped with DI) are purchased by all Television Households, the fraction of these sets that are purchased by addressable subscribers who did not have a DI TV in the previous year is (to first order) proportional to their relative number compared to all TVHH:

$$\text{NewAddr.SubsWithDITV's[year(n)]} =$$

$$= \text{TV'sSoldwithDI[year(n)]} \times \frac{\text{Addr.Subs[year(n)]} - \text{TotalAddr.SubsWithDITV's[year(n-1)]}}{\text{TVHH[year(n)]}}$$

This number may even be an overestimate of the new DI equipped TV purchases by addressable subscribers, as it does not take into account the reduced likelihood that such a TVHH will purchase a DI TV if it has been recently equipped with a DI VCR. Rather, statistical independence between such purchase events is assumed.

(6) (b) New Addr. Subs With DI VCR's. New Addressable subscribers who purchase their first Decoder Interface equipped VCR that year. Since VCR's (equipped with DI) are purchased by all Television Households, the fraction of these sets that are purchased by addressable subscribers who did not have a DI VCR in the previous year is (to first order) proportional to their relative number compared to all TVHH:

$$\text{NewAddr.SubsWithDIVCR's[year(n)]} =$$

$$= \text{VCR'sSoldwithDI[year(n)]} \times \frac{\text{Addr.Subs[year(n)]} - \text{TotalAddr.SubsWithDIVCR's[year(n-1)]}}{\text{TVHH[year(n)]}}$$

This number may even be an overestimate of the new DI equipped VCR purchases by addressable subscribers, as it does not take into account the reduced likelihood that such a TVHH will purchase a DI VCR if it has been recently equipped with a DI TV. Rather, statistical independence between such purchase events is assumed.

(7) (a) Total Addr. Subs With DI TV's. The total number of addressable subscribers with Decoder Interface TV's. A conservative assumption is made that no equipment attrition takes place. Thus this total is given by:

$$\text{TotalAddr. SubsWithDI TV's [year(n)]} =$$

$$= \text{TotalAddr. SubsWithDI TV's [year(n-1)]} + \text{NewAddr. SubsWithDI TV's [year(n)]}$$

(7) (b) Total Addr. Subs With DI VCR's. The total number of addressable subscribers with Decoder Interface VCR's. A conservative assumption is made that no equipment attrition takes place. Thus this total is given by:

$$\text{TotalAddr. SubsWithDI VCR's [year(n)]} =$$

$$= \text{TotalAddr. SubsWithDI VCR's [year(n-1)]} + \text{NewAddr. SubsWithDI VCR's [year(n)]}$$

(8) Total DI Addr. Subs With Watch & Record Capability. These are addressable subscribers who have both a DI TV and a DI VCR. A conservative assumption which will overestimate this number is made here: A statistical independence between the events of acquiring a DI TV and acquiring a DI VCR is assumed, thereby yielding the fraction of addressable subscriber who have both as the product of the fractions of addressable subscribers who have either one:

$$\text{Total DI Addr. Subs. With Watch N' Record} =$$

$$= \text{Column 8} = \text{Column 2} \times \left[\frac{\text{Column 7(a)}}{\text{Column 2}} \times \frac{\text{Column 7(b)}}{\text{Column 2}} \right] = \frac{\text{Column 7(a)} \times \text{Column 7(b)}}{\textit{Column 2}}$$

(4) % Sold With DI. Percent of TV's or VCR's units sold equipped with the Decoder Interface. A ramp up from 5% to 25% in 5% annual increments is assumed. For television sets, these numbers are significantly higher than those experienced during 1988-1990 roll-out of EIA 563-Multiport[5]. Because the VCR market is very competitive, essentially no VCR's with Multiport DI were ever shipped, making the present assumption overly optimistic.

[5] Only approximately one million Multiport equipped TV sets from RCA, General Electric, Panasonic, Quasar, Bang & Olufsen, Curtis-Mathes and JC Penney have been shipped since 1988 (*See* Comments of Cablvision Industries Corp. at 4.), constituting approximately 2% per year over the years these models were shipped.

TABLE 1

DECODER INTERFACE DEPLOYMENT PROJECTION (HIGHER END MODELS SCENARIO)

Note:	1		2	3		4	5		6		7		8
Year	TVHH (Million)	CATV Subs. (Million)	Addr. Subs. (Million)	Annual TV Unit Sales (Million)	Annual VCR Unit Sales (Million)	% Sold With Decoder Interface ("DI")	TV's Sold With DI (Million per Year)	VCR's Sold With DI (Million per Year)	New Addr. Subs With DI TV's (Million)	New Addr. Subs With DI VCR's (Million)	Total Addr. Subs With DI TV's (Million)	Total Addr. Subs With DI VCR's (Million)	*Total DI Addr. Subs With Watch & Record Capability (Million)*
1992	93.2	55.2											
1993	94.0	56.9	21.0	21	12								
1994	94.8	58.5	23.5	21	12								
1995	95.6	60.1	26.0	21	12								
1996	96.4	61.7	28.5	21	12								
1997	97.2	63.3	31.0	21	12	5%	1.05	0.60	0.33	0.19	**0.33**	**0.19**	***0.002***
1998	98.0	64.9	33.5	21	12	10%	2.10	1.20	0.71	0.41	**1.05**	**0.60**	***0.02***
1999	98.8	66.5	36.0	21	12	15%	3.15	1.80	1.11	0.64	**2.16**	**1.24**	***0.07***
2000	99.7	68.1	38.5	21	12	20%	4.20	2.40	1.53	0.90	**3.69**	**2.14**	***0.21***
2001	100.6	69.7	41.0	21	12	25%	5.25	3.00	1.95	1.16	**5.64**	**3.30**	***0.45***
2002	101.5	71.3	43.5	21	12	25%	5.25	3.00	1.96	1.19	**7.60**	**4.49**	***0.78***
2003	102.4	73.0	46.0	21	12	25%	5.25	3.00	1.97	1.22	**9.57**	**5.70**	***1.19***
2004	103.3	74.6	48.5	21	12	25%	5.25	3.00	1.98	1.24	**11.54**	**6.95**	***1.65***
2005	104.2	76.2	51.0	21	12	25%	5.25	3.00	1.99	1.27	**13.53**	**8.22**	***2.18***
2006	105.1	77.8	53.5	21	12	25%	5.25	3.00	2.00	1.29	**15.53**	**9.51**	***2.76***
2007	106.0	79.4	56.0	21	12	25%	5.25	3.00	2.00	1.32	**17.53**	**10.82**	***3.39***
2008	106.9	81.0	58.5	21	12	25%	5.25	3.00	2.01	1.34	**19.54**	**12.16**	***4.06***

TABLE 2

DECODER INTERFACE DEPLOYMENT PROJECTION (ALL MODELS SCENARIO)

Note:	1		2	3		4	5		6		7		8
Year	**TVHH (Million)**	**CATV Subs. (Million)**	**Addr. Subs. (Million)**	**Annual TV Unit Sales (Million)**	**Annual VCR Unit Sales (Million)**	**% Sold With Decoder Interface ("DI")**	**TV's Sold With DI (Million per Year)**	**VCR's Sold With DI (Million per Year)**	**New Addr. Subs With DI TV's (Million)**	**New Addr. Subs With DI VCR's (Million)**	**Total Addr. Subs With DI TV's (Million)**	**Total Addr. Subs With DI VCR's (Million)**	***Total DI Addr. Subs With Watch & Record Capability (Million)***
1992	93.2	55.2											
1993	94.0	56.9	21.0	21	12								
1994	94.8	58.5	23.5	21	12								
1995	95.6	60.1	26.0	21	12								
1996	96.4	61.7	28.5	21	12								
1997	97.2	63.3	31.0	21	12		0.00	0.00	0.00	0.00	**0.00**	**0.00**	***0.000***
1998	98.0	64.9	33.5	21	12	100%	21.00	12.00	7.18	4.10	**7.18**	**4.10**	***0.88***
1999	98.8	66.5	36.0	21	12	100%	21.00	12.00	6.13	3.87	**13.30**	**7.98**	***2.95***
2000	99.7	68.1	38.5	21	12	100%	21.00	12.00	5.31	3.67	**18.61**	**11.65**	***5.63***
2001	100.6	69.7	41.0	21	12	100%	21.00	12.00	4.67	3.50	**23.29**	**15.15**	***8.60***
2002	101.5	71.3	43.5	21	12	100%	21.00	12.00	4.18	3.35	**27.47**	**18.50**	***11.68***
2003	102.4	73.0	46.0	21	12	100%	21.00	12.00	3.80	3.22	**31.27**	**21.73**	***14.77***
2004	103.3	74.6	48.5	21	12	100%	21.00	12.00	3.50	3.11	**34.77**	**24.84**	***17.81***
2005	104.2	76.2	51.0	21	12	100%	21.00	12.00	3.27	3.01	**38.04**	**27.85**	***20.77***
2006	105.1	77.8	53.5	21	12	100%	21.00	12.00	3.09	2.93	**41.13**	**30.78**	***23.66***
2007	106.0	79.4	56.0	21	12	100%	21.00	12.00	2.95	2.86	**44.08**	**33.63**	***26.47***
2008	106.9	81.0	58.5	21	12	100%	21.00	12.00	2.83	2.79	**46.91**	**36.42**	***29.21***